



The Dryden

X-Press

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Steady as she goes

Dryden workforce, budget appear to be on even keel

By Jay Levine
X-Press Editor

Poppies will bloom in the desert spring, but the yield from the nation’s financial garden is less certain and is obscured by thick, hardy weeds.

Though the garden remains in need of work in the form of a fiscal year 2012 NASA budget – even as Congress continues to grapple with the 2011 fiscal year that is nearing its halfway point – Dryden remains on solid ground, said Center Director David McBride.

During a media briefing and a Dryden town hall meeting held in recent weeks, McBride highlighted the key points and Dryden elements of President Barack Obama’s proposed 2012 NASA budget. The president’s budget includes \$18.7 billion for NASA, about \$300 million less than the proposed budget for fiscal year 2011 and the same as the 2010 NASA budget.

Dryden’s 2012 budget is \$283.8 million, down more than \$10 million from the proposed 2011 budget, but \$19 million more than the 2010 budget of \$264.8 million. McBride said he anticipated a steady future for Dryden’s work and staff.

Deputy NASA Administrator Lori Garver spoke to Dryden employees Feb. 22 about the budget, telling them, “you play a key role in our budget. Dryden is a national treasure, a gem, a jewel, and we recognize that at NASA Headquarters.”



ED11 0055-01 NASA Photo by Tony Landis

David McBride, Dryden center director, greets NASA Deputy Administrator Lori Garver as she arrives at the Dryden ramp.

Despite the budgetary challenges, she said the agency is aligned with the nation’s goals and will “do the things that no one else can do.” Those tasks include supporting the International Space Station, stabilizing the aeronautics budget, putting an emphasis on development of space technologies, working toward future exploration systems, and conducting unique Earth science missions agency-wide that will “benefit the future of humanity.”

Taking a broader view of NASA,

Garver said national investment in the agency is like the investment in a student’s college education, which has potential to benefit many.

At Dryden, 2012 key budget elements are:

- Research supporting NASA’s aeronautics initiatives is proposed at \$72 million for uninhabited air systems integration into the national airspace, aviation safety and environmental responsible aircraft.

Among aeronautics projects are the uninhabited aircraft in the national airspace effort being conducted jointly with the Federal

Aviation Administration and the Department of Homeland Security. The blended wing body test bed can offer solutions to safety and environmental concerns; its shape and configuration could enable future transports and cargo aircraft to reduce fuel usage by 20 to 40 percent.

In addition, the DC-8 flying laboratory will be used in ground and air testing of new algae-based alternative fuels.

- Science is budgeted for \$70 million, primarily for Earth science observations from aircraft, with an emphasis on climate change. Also included is development and operation of the Stratospheric Observatory for Infrared Astronomy, which is based at the Dryden Aircraft Operations Facility in Palmdale.

- Space Technology at Dryden is to receive \$30 million in the proposed budget for the Dryden Innovation Fund, disbursement of selected Small Business Innovation Research and Small Business Technology Transfer work and program awards for the Dryden-managed Flight Opportunities Level 2 program office. The latter is tasked with supporting emerging commercial space launch companies in development of new technologies and providing spaceflight opportunities aboard these new

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F-15B will support study of new tools

Probes could improve understanding of sonic booms

By Gray Creech
Dryden Public Affairs

Dryden is flight-testing two new supersonic shockwave probes to determine their viability as research tools.

The probes were designed by Eagle Aeronautics of Hampton, Va., and manufactured by Triumph Aerospace Systems of Newport News, Va. The probes were first tested in a wind tunnel at Langley Research Center in Hampton.

The new probes are being flown on Dryden’s F-15B research test bed aircraft.

Supersonic flight over land is severely restricted in the United States and elsewhere because sonic booms created by the shockwaves emanating from supersonic aircraft are an annoyance to many and can damage private property.

Sonic boom researchers hope the Eagle Aero probes will increase understanding of supersonic shockwaves. The ultimate goal of NASA’s sonic boom research is to find ways to control the shockwaves and lessen the attendant noise so routine supersonic flight is possible.

“Using these probes can be a real benefit in understanding and modeling shockwave generation and the associated sonic booms,” said Dryden research engineer



ED11 0037-01 **NASA Photos by Carla Thomas**
Above, the Eagle Aero probes fly attached to the device underneath NASA’s F-15B research test bed aircraft. Below is a closer look at the device and where it is attached on the aircraft.



ED11 0037-04
Dan Banks. “They could allow us to accurately define the near-instantaneous flight conditions of an aircraft being probed, while defining the airplane’s flow field.

The probes also provide flight-condition data on the host aircraft.”

The primary objective of the flight series is to determine the feasibility of using the Eagle probes for air-to-air shockwave probing. Additional objectives include determining the probes’ durability in flight, their sensitivity to flight conditions and the accuracy of the software.

During the initial flight-test phase, the probes are attached to an adapter that hangs on the aircraft’s centerline instrumented pylon, or

CLIP. A large splitter plate separates the CLIP from the F-15B, protecting the aircraft in the unlikely event of flutter, or damaging vibration, that might cause the probes to break off the pylon.

The two probes, one wedge-shaped and the other conical, are mounted side by side on the CLIP. Both are designed to make precise measurements of supersonic airflow, improving the quality of shockwave data gleaned by engineers.

If the probe combo proves viable in the initial test series researchers could develop a follow-on series in which the probes are attached, one at a time, to the F-15B’s nose so each is exposed to the clean airstream in front of the aircraft.

Later test flights could include a second supersonic aircraft flying ahead of the probe-carrying F-15B to generate shockwaves for an early look at the probes’ shockwave-sensing capabilities.

Past supersonic shockwave probing efforts, such as the Lancets project flown at Dryden in 2008-09, were made with a standard probe. The more streamlined Eagle Aero probes contain accurate high-response transducers that help eliminate lag or other errors as they measure upstream and downstream airflow conditions as well as flow angles.

Mishap investigations reveal lessons learned for future use

Two completed mishap investigations resulted in some lessons learned.

ER-2 ejection seat back injury:

- Employees unaware of how to properly lift an object should seek clarification prior to attempting the task.
- If a team-lift is to be undertaken, the lifting technique, the timing of when everyone should begin the

lift, and the destination, including the route, should be discussed and agreed upon. Assuming that everyone is properly informed and in agreement could result in injury.

Employee tripped and sustained a head injury:


- Maintain situational awareness at all times to avoid slip-and-trip accidents, the most common mishaps.

March 4, 1948 – NACA research pilot Herbert H. Hoover became the first civilian to break the sound barrier when he flew X-1 (46-063) to Mach 1.029 at 40,000 feet.

March 25, 1959 – First X-15 flight by an NACA pilot. Joseph A. Walker flew X-15 (56-6670) to 48,630 feet and Mach 2 (1,320 mph).

March 2, 1977 – Final captive-inert flight-test of space shuttle orbiter Enterprise on top of the 747 SCA (N905NA).

March 1, 2001 – For the first time, two 747 SCAs, each carrying a shuttle orbiter, were airborne simultaneously. Columbia, atop 747 N905NA, departed from Air Force Plant 42 in Palmdale and Atlantis, atop 747 N911NA, departed from Edwards.





ED11 0049-66 NASA Photos by Tom Tschida
Kathleen Howell explains key points about the NASA Ikhana aircraft, which is remotely piloted, to Tech Trek students and their chaperones.

Tech Trek students visit

A group of 32 middle school girls and their teachers and parents recently went on a “Tech Trek” tour of Dryden to spark the students’ interest in aerospace engineering. The tour for seventh-grade girls who have shown proficiency in science and math classes is part of a program conducted annually by the Antelope Valley branch of the American Association of University Women. The AAUW program, which sends about 15 girls to a one-week summer science camp at several university campuses, is designed to encourage middle-school girls to consider careers in scientific, technical or engineering fields. It focuses on the so-called STEM disciplines – science, technology, engineering and mathematics – that must be mastered to enter technical career fields. This year’s tour of Dryden began with briefings on women in engineering by Jennifer Cole, supervising aerospace engineer in

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Above, Tech Trek tour students and their chaperones take a closer look at the interior of one of NASA’s two modified Boeing 747 Shuttle Carrier Aircraft. At left, Dryden meteorologist Franzeska Houtas demonstrates some of the equipment used for aviation weather monitoring and forecasting.

ED11 0049-88

News at NASA

Wake up, Discovery!

NASA has announced the winners of a contest in which two songs were chosen to awaken space shuttle crewmembers during the STS-133 mission. The final tally of submissions to the shuttle program’s “Face in Space” campaign was also released. Nearly 2.5 million votes were cast in the song contest and more than 292,000 photographs submitted for the Face in Space campaign. The contest ran from Aug. 20-Nov. 1, 2010. Song contest participants voted from a list of 40 songs that have previously awakened shuttle crews. With 722,659 votes, “Blue Sky,” by Big Head Todd and the Monsters, was the most-requested song to wake Discovery’s crew. The song received 29.3 percent of total votes cast. Finishing second was the theme from Star Trek (original TV series). It received 671,133 votes, or 27.2 percent of the vote. To see the results for all 40 songs, visit <https://songcontest.nasa.gov>. The Face in Space campaign received 194,181 photos that will be uplinked to Discovery via Mission Control at Johnson Space Center in Houston. The images will return to Earth through a data transmission, and contributors will be able to print certificates verifying that their photos flew aboard Discovery. More than 98,000 other photos already have been submitted to fly aboard the next shuttle mission. Shuttle Endeavour’s STS-134 flight is targeted to launch April 19. Submissions will be accepted though day of the lift-off. To take part in the Face in Space campaign, visit <http://faceinspace.nasa.gov>.

Event features former Dryden pilot

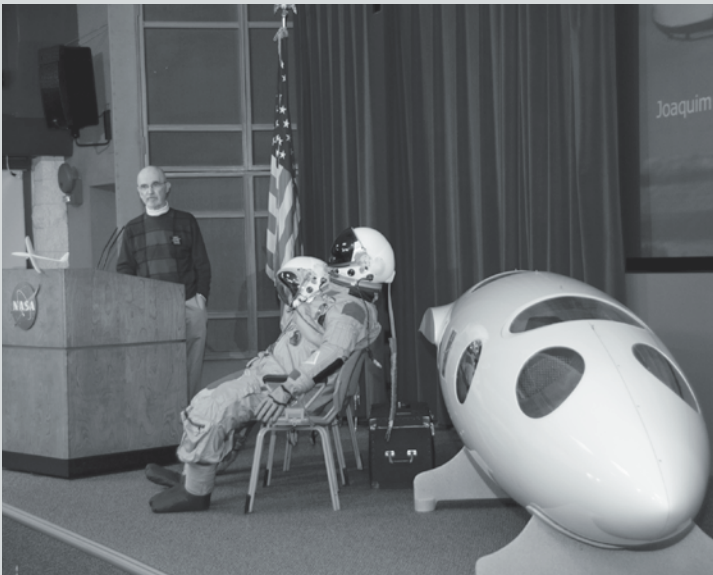
Former Dryden pilot Einar Enevoldson participated in two colloquium sessions Feb. 25.

The morning session marked the 50th anniversary of former Dryden Center Director Paul Bikle’s 1961 altitude record. John and Hugh Bikle, sons of the late center director, joined Enevoldson in discussions about the record soaring flight.

Later, Enevoldson discussed “Perlan: The Past and Future of Sailplane High-Altitude Flight.”

Enevoldson co-piloted the first stratospheric flight of a sailplane, which the late Steve Fossett piloted. That 2006 flight set a sailplane record altitude of 50,671 feet.

Enevoldson also discussed a new effort by the Perlan Project, the group that supported the previous Perlan flight, which plans to launch a new Perlan sailplane to 90,000 feet in July 2012.



ED11 0055-23 NASA Photo by Tony Landis

Former Dryden pilot Einar Enevoldson spoke at two colloquium sessions at Dryden on Feb. 25. He discussed former Center Director Paul Bikle’s record glider altitude flight as well as his own role in the Perlan 2006 sailplane altitude record set in Argentina. Enevoldson is currently part of an effort to reach 90,000 feet altitude with a new aircraft, also called Perlan. A mockup of the new Perlan aircraft is at right.

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spacecraft for research.

- NASA’s Science, Technology, Engineering and Mathematics, or STEM, education efforts are budgeted for \$11 million.
- Exploration funds equal \$3 million for testing to support the multi-purpose crew vehicle. As NASA develops a replacement for the space shuttle, it will continue work on an escape system, such as the one successfully tested at White Sands Missile Range, N.M., in May 2010.
- The remaining portion of the budget, \$98 million, is for meeting institutional requirements, including \$76 million for cross-agency support, \$22 million for construction and environmental compliance restoration for minor revitalization and construction projects to repair and modernize center infrastructure, and to reduce the risk of mission disruption due to facility failures.

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the aerodynamics branch of Dryden’s Research and Engineering Directorate, and on NASA’s INSPIRE online educational program for high school students by aerospace education specialist Beth White.

Following the briefings, the group toured Dryden’s aircraft hangars, the model shop and one of the modified Boeing 747 Shuttle Carrier Aircraft, then rotated through a series of specialized tours and briefings on the Ikhana/Predator B unmanned aircraft, fixed-position flight simulators and aviation weather forecasting.



Jennifer Cole, supervising aerospace engineer in the aerodynamics branch of Dryden’s Research and Engineering Directorate, talks with Tech Trek students about careers in engineering.

ED11 0049-05 NASA Photo by Tom Tschida

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Address: P.O. Box 273, Building 4839
Edwards, CA 93523-0273
Phone: 661-276-3449
FAX: 661-276-3566

Editor: Jay Levine, Tybrin, ext. 3459

Asst. Editor: Sarah Merlin, Tybrin, ext. 2128

Managing Editor: Steve Lighthill, NASA

Chief, Strategic Communications:
John O’Shea

National Aeronautics and
Space Administration

Dryden Flight Research Center
P.O. Box 273
Edwards, CA 93523-0273

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